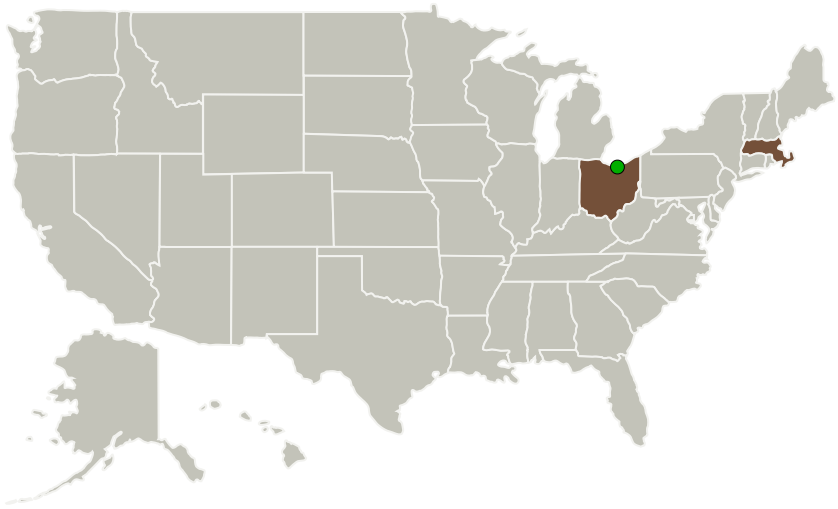
Green Liquid Monopropellant Thruster for In-space Propulsion, Phase I

Completed Technology Project (2011 - 2011)

Project Introduction

Physical Sciences Inc. and AMPAC In-space Propulsion propose to develop a unique chemical propulsion system for the next generation NASA science spacecraft and missions that is compact, lightweight, and can operate with high reliability over extended periods of time and under wide range of thermal environments. The system uses a storable, low toxicity, monopropellant as its working fluid. Under this SBIR program we propose to investigate applications of this monopropellant to the design of in-space propulsion systems appropriate for NASA planetary spacecraft and missions. In Phase I, we propose to experimentally characterize the propellant ignition and combustion processes in detail and use the data to develop design concepts for a liquid monopropellant thruster. In Phase II, we propose to develop and deliver a small scale proof-of-concept engineering prototype thruster. Upon successful technology development under the SBIR program, full-scale protoflight and space flight propulsion systems applicable to specific missions will be developed in Phase III NASA programs.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Physical Sciences, Inc.	Lead Organization	Industry	Andover, Massachusetts
Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Massachusetts	Ohio

Project Transitions

February 2011: Project Start

September 2011: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140210)*

Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Organization:

Physical Sciences, Inc.

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Prakash B Joshi

Co-Investigator:

Prakash Joshi

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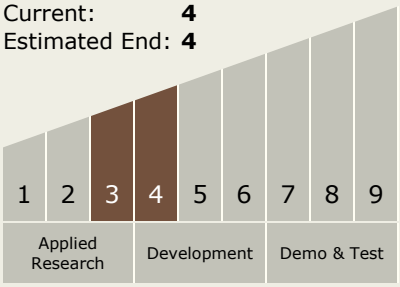
Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



Technology Areas

Primary:

- TX01 Propulsion Systems
  - TX01.1 Chemical Space Propulsion
    - TX01.1.1 Integrated Systems and Ancillary Technologies

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System